

By stating the goals of a business in declarative form, wherein the goals are specifically stated as measurable objectives, and the means for attaining the goals in similar declarative form as rules, wherein the internal and external real-world conditions are used as preconditions that, when met, allow the rules to actuate, and then repeatedly circulating through the rule sets with each rule actuating only when it is logically, that is, 'true' for it to do so, a business can focus on attaining its goals rather than on how it is acting. By further allowing the modification, deletion, and creation of new rules, and new rule sets, to meet or correct for increasingly detailed specifications, newly-perceived real-world truths, newly-determined business goals, and newly-encountered internal contradictions, a flexible, adaptive, and dynamic method and apparatus for business management can be realized which minimize risks, allow for the capitalization of human knowledge, and move from production-push to demand-pull business management suitable for the modern era. As authority, responsibility, and accountability are delegated in a linked fashion to attainment of business objectives and subordinate objectives, internal and external flaws or differences between the business' internal model and the external reality are more accurately tracked and correctable with a minimum of management.

In the Final Office Action, the Examiner contends that pending Claims 112-190 and 192 contain subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. On the contrary, the subject matter of the invention is described in detail in the written description of the present application and the accompanying figures of the drawing.

For example, independent Claim 112 is set forth below with references to the text and figures that describe the limitations of the claim (__:__ refers to Page:Line Number(s)):

112. A computer-implemented business method [**Fig. 2; 14:10-16 and 14:2-6**] for actively and declaratively [**14:3**] managing, implementing, and executing a first dynamic process [**Fig. 2, numeral 16; 17:22**] incorporating a dynamic pattern of operations [**Fig.**

2, numeral 17] driven by real-world conditions [**Fig. 2, numeral 18]** causing at least a first behavioral pattern to emerge [**Fig. 2, numeral 19]**, said computer-implemented business method comprising:

(a) [**17:24-18:2]** declaring and stating an objective of said first dynamic process [**also, Fig. 4; 14:6-9]** as a set of measurable Goals [**15:27-16:2 (defined)**] and Constraints [**16:26-17:4 (defined)**];

(b) [**18:28-31]** declaring and stating at least one objective Rule Set [**16:7-8 (defined)**] having a plurality of Rules [**16:3-6 and 19:19-21 (defined)**], said Rules in the said objective Rule Set being defined to accomplish at least a part of said objective by the combination of at least one subset thereof [**Fig. 2, numeral 16 and 12:26-29]**:

wherein the Rules in said objective Rule Set may act in any order [**18:31]** subject to the limitation that, for any specific Rule in said objective Rule Set, that specific Rule's Condition and applicable Constraints must be satisfied before that specific Rule's Action may occur [**16:3-5]**;

(c) [**20:19-21]** delegating [**17:16-17 ("Delegation" defined)**] to at least one specific set of Actors [**12:29-13:3 (defined)**] consisting of at least one Actor [**Fig. 2, numeral 17]**:

at least a first subordinate objective, subordinate to the objective, stating the first subordinate objective as a subset of subordinate, measurable Goals and subordinate Constraints [**13:17-20 and 20:22-27]**;

a set of Rules for accomplishing said first subordinate objective [**20:22, 29-30]**;

authority via at least one Rule stating authority for attaining the subordinate, measurable Goals of said first subordinate objective [**20:29-30]**;

accountability via at least one Rule stating accountability for attaining the subordinate, measurable Goals of said first subordinate objective [20:31-21:3]; and,
responsibility via at least one Rule stating responsibility for attaining the subordinate, measurable Goals of said first subordinate objective [20:30] subject to the Constraints and subordinate Constraints [20:7-17 (example)];

(d) [21:21-26] determining if at least one Rule's Condition [16:9-17 (defined)] is satisfied and if so triggering said Rule's Action [16:18-25 (defined)] [Fig. 2, numeral 18; 13:3-6; 21:24-26, 28-30];

wherein said Rule's Condition incorporates at least one Measurable [17:5-15 (defined)] value from at least one member of a set of sources; and,
said set of sources comprises a source internal to said first dynamic process, a source external to said first dynamic process, and a source in the real world [14:23-28];

(e) [19:14-16; 22:25-28; and 23:25-28 (preferred embodiment)] modifying at least one Element [17:18-19 (defined)] of said dynamic process through the Action [Fig. 2, numeral 18; 13:6-8 and 15:18-21] of at least a Rule whose Condition is triggered by at least one input from an event in the real world [21:21-30];

(f) [12:31; 17:17] defining any Actor as being at least one member of an Actor set comprising human agent, semi-automated agent, and automated agent;

(g) [17:18-19] defining any Element as being one member of an Element set comprising a Goal, Rule, Rule Set, Condition, Action, Constraint, Measurable value, and Delegation;

- (h) [18:28-30; 16:3-25] defining each Rule so as to comprise a Condition that is satisfied when it evaluates to a specified and predetermined value and an Action that is triggered when the Condition is satisfied;
- (i) [18:31-19:7; 21:21-30] determining the triggered Action of at least a first Rule and its relative order with respect to a second Rule's Action, and therefore the behavior of the dynamic process, at least partially by logical inference from Conditions and Constraints [16:9-17; 16:26-17:4] rather than said relative order being predetermined and required by human mandate;
- (j) [19:8-13; 21:21-23; 22:1-11] executing automatically at least a subset of the dynamic pattern of operations that progresses towards said objective, defining said subset of the dynamic pattern of operations as comprising a plurality of operations, each operation therein being temporally contiguous to at least one other operation in said subset of the dynamic pattern of operations; and,
- (k) [17:29-31; 18:30-31; 22:25-23:4] specifying a plurality of Elements and implementing each of the steps of declaring and stating [17:24-25], delegating [20:19-25; 20:29-21:3; 18:6-12], determining [21:21-30], and modifying 22:9-12; 24:27-31 (**best embodiment**)], through a declarative and therefore non-procedural representation [17:24-31].

Thus, the steps of the method defined by Claim 112, as well as the elements of pending apparatus Claim 192, are disclosed in both the specification and the drawing sufficiently for a person of skill in the art to make and practice the claimed invention.

Contrary to the contention by the Examiner that the result of the invention lacks concreteness because the result is not assured and reproducible, the invention defined by Claim 112 is concrete, because the result, that is, the "objective," is stated "as a set of measurable Goals and Constraints" and Rules are also stated "to accomplish at least a part of said objective by the combination of at least one subset" of the Rules. The

“specific Rule’s Condition and applicable Constraints must be satisfied before that specific Rule’s Action may occur.” However, once the stated Rule Condition and any applicable Constraint are satisfied, then the Action associated with the satisfied Rule is executed. Consequently, contrary to the Examiner’s contention, the claimed invention can be used as intended without undue experimentation, because Constraints and Rules (comprising Conditions and Actions) are specified during the process defined by Claim 112 such that the result is concrete if the specified Action is executed when the Condition(s) and Constraints are satisfied, and the result is therefore both assured (due to compliance with both the Condition(s) and Constraints) and reproducible (the Action is executed only when, and each time, the Condition(s) are met and the Constraints are not violated).

Additionally, the specification and Claim 112 explicitly define the key terms for persons skilled in the art to provide enablement. The specification at 15:26-17:19 states:

Definitions

A “Goal” is a preferred, real-world position. Goals may be relative (“15% more sales than last year at this time”) or absolute (“Gross Income in the next fiscal year of at least \$1,000,000.00”). A Goal has a truth value that the dynamic process is intended to change from false to true. A Goal may have a temporal mode, which in turn may be implicit, explicit, or undetermined (e.g. “Next year”, “Next Quarter”, or “Later”.) Goals reflect the purpose of a dynamic process, that is, the change in actual state that the process is intended to bring about.

A “Rule” is defined as a pairing of Condition and Action. The triggering of any rule implicitly affirms that the Condition for that rule have been determined to be true, i.e. real. Both a Condition and a Rule may have zero, one, or more logically independent portions linked by any measurable operator.

A “Rule Set” is one or more Rules with at least one common Element, even if said common Element is only membership in the same Rule Set, gathered together.

A “Condition” is defined to be a particular factual circumstance in the real world, such as a market situation, a business event, or any other discrete and measurable happening or truth. Even an individual’s decision (e.g. “It’s time to start the fall inventory build-up”) can become a Condition (“Time To Start Fall Inventory Build-up = NOW”). A Condition can be either a factual circumstance internal or external to a business or a dynamic process. A Condition can be quite complex, and can combine various factual circumstances, both conjunctively and disjunctively (“At least two out of three managers agree to sell the company, and the cost/benefit of doing so meets our guidelines, but the market is not temporarily depressed”).

An "Action" is defined to be a particular dynamic operation that will in turn create a new particular factual circumstance. An "Action" can be, for example, a business event (e.g. "Order new inventory"), a request to a human for information or for a decision ("Should we use supplier A or supplier B?"), a decision to set a new Goal ("Increase sales by a further 20%"), or a decision to set a new constraint ("No expenses above \$5,000,000 may be authorized by anyone other than the president or treasurer"). Additionally, an "Action" can also include creation, modification, or deletion of a Rule (for example, when an internal contradiction is found).

A "Constraint" is a measurable value (such as the existence or non-existence of an item in inventory, the price of an item, or the presence of all necessary inputs for manufacturing an item) that must be satisfied, i.e. true, before a Rule incorporating that Constraint may be activated. The distinction between a Condition and a Constraint is that the condition permits a rule to activate if true, while a constraint prevents a rule from activating if true. (For example: "At least 20% of all sales by dollar value must come from products created within the past two years" is a Constraint.) The difference between a Condition and a Constraint may be in form ("If A is true" vs. "Only if not-A is not-true"); but it also may reflect how the dynamic process is to handle the real world problem of an unknown middle value that is not known to be either true or false.

"Measurable" means reducible to an objective and transcribable value. Measurable values include any numerical or ordered value, true or false value, membership of a set, any duration, or any particular mensuration. ("Sales of more than \$2,000,000"; "Sales greater than last year's"; "from any EEC member"; "within thirty days of receipt of an invoice"; "weighing more than 30 tons".) A value that must be determined by a human being is measurable only to the extent that either all such possible values, or the process(es) for such reduction (including the specification of the individual human responsible for completing the process) are specified. (E.g. "One can like, be neutral about, or dislike, the product; these are the only emotional reactions we care about." "The wine is deemed salable for more than \$5 per bottle by the senior oenologist on site at the time of bottling.")

"Delegation" is the assignment of responsibility, authority, and accountability for operational performance and reporting to a particular actor, whether human or automated.

An "Element" is any of a Goal, Rule, Rule Set, Condition, Action, Constraint, Measurable value, or Delegation.

Additionally, the specification describes various examples to enable a person skilled in the art to make and practice the invention. One example is described in conjunction with Figs. 2 and 3, in which Fig. 2 outlines the major steps of the method described in one embodiment of the invention and Fig. 3 is a general outline of how a computer program

instantiating that embodiment of the invention can be created out of pre-existing, state-of-the-art tools.

The specification describes a first implementation as follows at 12:23-13:8 and 13:21-24:

Figure 2 outlines the major steps of the method described in this embodiment of the invention. In the first step (15), the objectives of a dynamic process (in this Figure, a for-profit business) are stated as measurable Goals. The Goals stated in (15) form a sub-set describing the objective of growing the business. In the second step (16) each production or process rule which drives growth of sales is stated as a condition plus action; according to (16), customers will have orders shipped when the item is in stock, but if the item is not in stock, a new one will be produced. In the third step (17), the delegation of duties relevant to obtaining customers and responding to customer orders is specified. The particular individual mentioned in (17) inherits the condition as a goal of 'Obtaining New Customer' from the existing rule (an intermediate step, detailing 'North American Sales' as part of 'Sales' was left out of the drawing as one obvious to any practitioner skilled in the practice of sales or business delegation). In the fourth step (18), the operation of the method becomes automatic as the external world is compared to the conditions stated in the Rules and the data concerning performance becomes updated as actions leading towards Goals takes place. The fifth step (19), is internalizing feedback by monitoring performance and the real world against the previously specified Goals, with specific handling of contradictions by internal modification until they are resolved.

Figure 3 is a general outline of how a computer program, or a device, for instantiating this embodiment of the invention can be created out of pre-existing, state of the art tools....

....Both sources of the contradiction can be clearly identified within the process flow known to (22). (An order must be shipped to meet quarterly sales quotas, though no product to fill the order exists.)

Another exemplary implementation is described in the specification from page 17 through page 22, as evidenced by the following excerpts:

First, the business' objectives are explicitly stated as a set of measurable goals and constraints....These objectives are stated declaratively and (in the preferred embodiment) are stated so as to be suitable for reduction to a form of or logic and instantiation on a computer. 17:24, 17:31

For example, a business' objective might be stated as "Ensure that every communication is responded to within the same business day as it was received," [measurable goal] "in order of priority and using the closest similar method outgoing as was used incoming" [constraints]. An executive vice-president may

institute a further objective “Only pass directly on to me a limited set of communications for my personal handling of the response” [measurable goal] “those communications being, in order of priority: from known customers, from other individuals in this business (superiors before peers before subordinates), from previously-established vendors offering new items or changing terms of price, payment, or delivery, or from my family” [constraints], and pass this secondary objective down to the office receptionist. 18:3-12

Second, the means for meeting the business’ objectives are stated as a set of rules. Each rule contains both a precondition and a response (also known as a condition and action). These rules are again stated declaratively; and they are stated as a set rather than in a hierarchy, thereby permitting their operation in any combination. 18:28-31

For example, if one rule set for the receptionist were to state: ‘Upon entering the office, institute action to return all telephone messages before proceeding to act on the day’s e-mail’, and a second rule set were to state: ‘Upon entering the office, institute action to return all e-mail messages before proceeding to act on to the day’s telephone messages’, these rule sets would be potentially inconsistent. Yet as long as a precondition is established to differentiate between them, no such contradiction would actually be encountered. (Examples of such a precondition might be: “Upon the vice-president’s returning from an electronics forum, e-mails get priority”; “On Tuesdays, telephone messages get priority”, or “In the absence of any other guideline, randomly select a rule-set and stick with it for that day, to test its effectiveness.”) 19:23-20:2

Third, operational performance of the rules, and responsibility for attaining the predefined goals and obeying the predefined constraints, are delegated throughout the business to specific individuals, other business units, or even to automated subsystems. 20:19-21

For example, the vice-president and receptionist both inherit the top-level objective (“Ensure that every communication is responded to within the same business day as it was received”) as a goal, the constraints of that top-level objective (“in order of priority” and “using the closest similar method outgoing as was used incoming”) as constraints, and apply these to their own rule-set and actions. Thus the receptionist will pass on to the vice-president only those messages meeting the conditions of the additional rule (“pass directly on to me a limited set of communications for my personal handling of the response”) and handle the remaining messages; and both will respond within the same business day according to the constraints they are operating under. Failure to perform, or the need to alter a rule (“What do I do when a U.S. Government attorney calls for you?”), are equally measurable and serve as the inspiration for amendment, creation, or deletion of a rule at the level where the need to meet the real-world complexity occurs. 21:8-19

Fourth, the business’ operation is made increasingly automatic, that is, responsive to external conditions rather than internal expectations, as the rule-satisfaction is made responsive to conditions as they exist in the real world and are applied to the rule-set(s). 21:21-23

For example, each new incoming message would trigger the precondition for the rule stated above (“Ensure that every communication is responded to within the same business day as it was received”). If more messages are received at one time than can be responded to, either the first condition (“in order of priority”) or second condition (“using the closest similar method outgoing as was used incoming”) may govern the response. A lower-priority message may be responded to before a higher-priority message simply because the higher-priority message would require an asset (e.g. the fax machine) which is currently tied up with another response. Or the receptionist may delay responding to an incoming message while transferring the sub-set meeting the appropriate preconditions to the vice-president for his handling, as the best means of meeting the overall goal of responding to every message. 22:1-11

Fifth, feedback is internalized, and becomes linked with, rather than disparate from, operations, as the processes for creation, deletion, modification, and correction of both objectives and means (or goals, constraints, conditions, and actions) are declared as explicit consequences of rules governing the business. (For example: “If no objective is met within a day, new rules specifying objectives that can and will be met within a day will be created, unless existing rules can be further differentiated to specify objectives that can be met within a day”, can be a rule for modification. 22:25-31

In view of the definitions and examples disclosed in the application, it is respectfully submitted that that a person skilled in the art is able to make and practice the claimed invention without undue experimentation. Furthermore, both Davis, *et. al* (The Information System Consultant's Handbook, Dec. 1998) and McDermid (Software Engineer's Reference Book, 1991), cited by the Examiner, have discussions of expert systems and rules. These references evidencing the level of a person skilled in the art, together with the disclosure of the application, evidence that a programmer familiar with knowledge-based systems engineering would be enabled to implement an embodiment of the invention without undue experimentation.

Claim Rejection Under 35 USC §101

The Final Office Action also rejects pending Claims 112-190 and 192 as directed to non-statutory subject matter. Generally, legal precedent very clearly sets forth the standards for patentability according to our patent law. In the case of In re Alappat, 33 F.3d 1526 (Fed. Cir. 1994), the Court of Appeals for the Federal Circuit, sitting *en banc*, overturned

the USPTO and found that inventions that include mathematical formulas or algorithms are not unpatentable if they are practically applied. Thus, the mere presence of an algorithm within an invention does not exclude the entire invention from patentability. The key question to be answered is whether the claimed invention, when looked at "as a whole," is an abstract idea, such as a disembodied mathematical concept, or whether the invention produces a practical application, which achieves a "useful, concrete and tangible result."

Four years after In re Alappat came the most well-known case with regard to business methods: State Street Bank and Trust Co. v. Signature Financial, Inc., 149 F.3d 1368 (Fed. Cir. 1998). The State Street case involved a patented data processing system that transformed data representing discrete dollar amounts into a final share price momentarily fixed for recording and reporting purposes. The Federal Circuit noted that a process, machine, manufacture, or composition of matter employing a law of nature, natural phenomenon, or abstract idea may be patentable subject matter even though a law of nature, natural phenomenon, or abstract idea would not, by itself, be entitled to such protection. As such, the court held that a machine programmed to transfer data which represents discrete dollar amounts into a final share price through a series of mathematical calculations does, in fact, constitute the practical application of a mathematical algorithm, formula, or calculation because it produced a "useful, concrete and tangible result." The final share price resulting from this process enabled investors and their brokers to make investment decisions for investment and tax advantage purposes.

The significance of State Street goes beyond its immediate holding. The Federal Circuit in State Street explicitly rejected the notion that a "business method" exception exists in United States patent law, thereby ending any notion that inventions deemed to be business methods, by whatever

criteria, would be excluded from patentability on that basis alone. Thus, the State Street decision clarifies that an invention deemed to be a "business method" will be treated in the same manner as any other method or process invention. In other words, the patent system is technology neutral and there shall be no disparate treatment for different categories of inventions. This principle was reaffirmed by the CAFC in 1999, where the court remanded the case of AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352 (Fed. Cir. 1999) to the district court and concluded that had the court applied the proper analysis, the claimed telephone call tracking method fell comfortably within the "broad scope of patentable subject matter under § 101."

Contrary to the Examiner's contention, the subject matter defined by the pending claims provides a concrete result, as explained above. The examples set forth in the specification further attest to the concreteness of the claimed invention.

Additionally, the Examiner's statement that: "In order to be tangible, the invention must provide a real world result and must involve more than a manipulation of an abstract idea," implies that the subject matter defined by Claims 112 and 192 is not tangible. The Final Office Action, however, fails to mention a specific sub-step of Claim 112 that addresses this particular objection. Claim 112 specifically recites a limitation of:

"executing automatically at least a subset of the dynamic pattern of operations that progresses towards said Objective".

The result is described in the specification as follows:

"This allows the business to continually modify its actual operation to the most effective set and dynamic pattern of operations by letting the real-world conditions, rather than an externally-imposed preconceived hierarchy of operations, dominate the business' behavior and interactions with the real-world..." (p. 18)

Additionally, Claim 192 recites:

“means for using said set of steps of declaring, stating, delegating, determining, and modifying, to further the attainment of a Goal of said first dynamic process independent of human action;”.

The Examiner also contends that the claimed invention is merely a “‘reasoning paradigm,’ (i.e., theoretical approach/roadmap).” On the contrary, the Claims are directed to a computer-implemented method (e.g., Claim 112) and apparatus (e.g., Claim 192) and are therefore **not** “theoretical.” Additionally, on complete reading of Claims 112 and 192, the totality thereof and the foregoing specific and explicit limitation effect a useful, concrete, and tangible result, i.e., that which moves the first dynamic process, and thus a business’ operation, towards attainment of the stated Goal(s) within the Constraints of action and decision.

Adapting a business’ operation to the ‘most effective set’ means saving money, time, and effort – any or each of which is a practical and thus useful result. Generations of information technology professionals have and do make a livelihood automating even a sub-portion of a business to save money, time, and effort, establishing that the marketplace considers these to be ‘useful, concrete, and tangible’ – and eminently practical – results.

The utility requirement is a minimal threshold. The law holds that “An invention is ‘useful’ under section 101 if it is capable of providing some identifiable benefit.” Juicy Whip, Inc. v. Orange Bang, Inc., 185 F.3d 1364, 51 USPQ 2d 1700, 1702 (Fed. Cir. 1999). In fact, the bias favors the inventor; the USPTO must prove a complete failure of utility, or, as the court said, “To violate 101 the claimed device must be totally incapable of achieving a useful result.” [citations omitted]; Brooktree Corp. v. Advanced Micro Devices, Inc., 977 F.2d 1555, 1571, 24 USPQ2d 1401, 1412 (Fed. Cir. 1992).

Furthermore, the Final Office Action simply disagrees with the assertion in the prior Response of multiple, specific, separate tangible results that are produced by the Applicant’s invention. These are more clearly enumerated in several specific dependent claims, as well as already mentioned in the specification. Five of the **many** tangible

results are: (1) the instantiation of a tangible, reproducible, transferable and thus saleable, model of a business' knowledge (specification, p. 13, lines 24-30; Claim 142); (2) instantiation (in a recorded form) of a tangible store of a business' human employees' knowledge of its operations that is capitalized, i.e., contained outside of the human employees' minds (specification p. 13, line 30 to p. 14, line 3; Claim 141); (3) the reduction of risk and thus decrease in operational loss and cost, both for operations (specification, p. 23, lines 20-26) and for delegation (specification, p. 23, line 27 to p. 24, line 2; Claims 131 and 148); (4) making process information accessible and susceptible to comparison and improvement as it is both made explicit rather than implicit and tied to measurement (specification, p. 19, lines 6-7; Claims 143, 150, 163).

Most particularly, the Final Office Action overlooks the specific dependent claims whereby any contradiction contained within the process is transformed, becoming not a source of error requiring external corrective intervention, but a source for and means of auto-correction (specification, p. 19, lines 18-25; Claims 167, 169-173). This specifically is a solution which no prior business method nor computer software implementation disclosed by the Examiner or known to Applicant or the independent expert first referenced by the PTO, had ever seen before.

Applicant again requests that specific notice be taken of the affidavit of Professor Hossein Bidgoli – an independent, third-party expert who was first referenced by the PTO – who has declared of Applicant's invention:

“Those with ordinary skill as described above, upon reading the inventor's application, would appreciate the invention's usefulness. Its advantages were clearly stated.” See *Bidgoli Declaration*, on file.

Neither evidence nor reason is offered to support the bare assertion by the Examiner that the claimed invention is “a reasoning paradigm that provides no concrete result, i.e., the result cannot be assured or reproduced.” Specific, factual reasons that would lead one skilled in the art to question the applicant's statement of usefulness must be provided for a challenge to be valid, In re Gaubert, 524 F.2d 1222, 187 USPQ 664, 666 (CCPA 1975).

No contradictory or opposing evidence was cited by the Examiner as disproving any of the five tangible and useful results cited above.

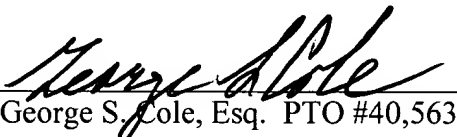
In the absence of any such support, the specific assertion of utility from the independent, third-party expert already on file must prevail. As the Final Office Action does not reference any contrary evidence, this determination of usefulness is currently unchallenged and dispositive.

Accordingly, this ground for rejection is traversed.

Conclusion

For all the reasons given above, it is respectfully submitted that the claims comply with the requirements of Sections 112 and 101 such that as the third party witnesses have already declared, these distinctions attain concrete, tangible, and useful results and are of patentable merit. Accordingly, Applicant requests that this amendment be entered and this application is now submitted to be in full condition for allowance, which action is respectfully solicited. Applicant requests a telephonic interview with the Examiner if the Examiner has any questions or believes that any issues remain respecting allowance of the application within two weeks of the filing of this reply.

Respectfully Submitted;


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